Drug Abuse Warning Network, 2004: Area Profiles of Drug-Related Mortality

ACKNOWLEDGMENTS

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August 2008

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UNDERSTANDING DAWN MORTALITY DATA

The Drug Abuse Warning Network (DAWN) is a public health surveillance system that monitors drug-related deaths referred to medical examiners and coroners (ME/Cs) in selected metropolitan areas and States. Findings in this publication reflect data on drug-related deaths that occurred during calendar year 2004 and were reported by participating medical examiners or coroners (ME/Cs) to DAWN. In selected tables, data from reporting year 2003 are included for comparison. The Office of Applied Studies (OAS) of the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services, is responsible for DAWN.

Since the mortality component of DAWN does not rely on a statistical sample of ME/Cs, the findings cannot be extrapolated to apply to jurisdictions not participating during 2004. The findings cannot be extrapolated to the United States as a whole. Because of changes introduced to DAWN in 2003, DAWN mortality data for 2004 are only comparable to data for 2003 and should not be compared to mortality data for any prior years.

Drug-related deaths

Findings in this publication all pertain to drug-related deaths reported by participating death investigation jurisdictions as DAWN cases. Since 2003, a DAWN case has been any death reviewed by a ME/C that was related to recent drug use.

DAWN cases are found through a retrospective review of decedent case files in each participating death investigation jurisdiction. The relationship between the death and the drug need not be causal; the drug need only be implicated in the death, and the drug use must have been recent. DAWN cases include deaths associated with drug misuse, whether intentional or accidental, as well as deaths related to the use of drugs for legitimate, therapeutic purposes. This includes, but is not limited to, explicit drug abuse.

These eligibility criteria for a DAWN case are intentionally broad and inclusive. Since death record documentation varies in clarity and comprehensiveness across jurisdictions and among ME/Cs, broad criteria reduce the potential for judgments that could cause data to vary systematically and unexpectedly across reporters and jurisdictions. Broad criteria also capture a very diverse set of drug-related cases, which are able to support a wide variety of analytical purposes and the interests of multiple audiences.

For decedents under the age of 21, DAWN cases include deaths where the only drug involved was alcohol. For those 21 and older, there must be at least one other drug involved besides alcohol for the death to be a DAWN case.

The data items submitted on drug-related deaths are shown in Appendix A.

Drugs

DAWN covers all types of drugs. Drugs eligible for DAWN include:

- Illegal or illicit drugs, such as heroin, cocaine, marijuana, and Ecstasy;
- Prescription drugs, such as Prozac®, Vicodin®, OxyContin®, alprazolam, and methylphenidate;
- Over-the-counter (OTC) medications, including aspirin, acetaminophen, ibuprofen, and multi-ingredient cough and cold remedies;
- Dietary supplements, including vitamins, herbal remedies, and nutritional products;
- Psychoactive, nonpharmaceutical inhalants;[1]
- Alcohol in combination with other drugs; and,
- For those under age 21, alcohol without any other drug.

Deaths included in this publication

Findings in this publication focus on two major categories of drug-related deaths, based on manner of death.

Deaths related to drug misuse, defined broadly to include drug misuse or abuse, include the following:

- **Natural or accidental deaths with drug involvement.** This category captures nonmedical use, overuse, and misuse of prescription and OTC medications not documented as drug abuse; documented drug abuse; and drug-related cases that could not be assigned to a more specific category. The determination of "natural" or "accidental" as the manner of death is made by the ME/C.
- **Homicide by drug.** This category was designed to capture malicious poisonings; that is, the decedent was administered a drug by another person for a malicious purpose. The determination of homicide as the manner of death is made by the ME/C.
- **Deaths with drug involvement when manner of death denoted by the ME/C was "could not be determined" (CNBD)**. This manner of death is assigned by the ME/C when a definitive ruling of suicide, homicide, natural, or accidental death is not possible.

Drug misuse deaths exclude two types of natural or accidental deaths: deaths that are the consequence of using a prescription or OTC pharmaceutical for therapeutic purposes, and deaths that involve the accidental use of a drug. The former would include deaths related to adverse drug reactions, side effects, and drug-drug or drug-alcohol interactions (but not deaths in which an illicit drug was involved). The latter would include, for example, an accidental poisoning by a child or by an individual who took the wrong medication or wrong dosage by mistake. Accidental ingestion is not synonymous with accidental death, a manner of death assigned by an ME/C.

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[1] To be reportable, a nonpharmaceutical substance must be consumed by inhalation, sniffing, or snorting and must have a psychoactive effect when inhaled. A death involving inhalation of a nonpharmaceutical, psychoactive substance and no other drug qualifies as a DAWN case. Carbon monoxide is excluded from the inhalants reportable to DAWN.

Drug-related suicides include suicides with drug involvement. The determination of suicide is made by the ME/C. Drug-related suicides include more than "overdoses." That is, a drug that was implicated in the death may not have been the cause of death.

Unit of measurement

Death is the primary measure of interest throughout this publication. To permit comparisons within or across areas or across demographic subgroups, death rates (i.e., the number of deaths per 1,000,000 population) have been added. This use of death rates is important because two areas with similar numbers of drug-related deaths may have vastly different populations, and two areas with similar populations may have different numbers of drug-related deaths. Rates, which take population differences into account, permit standardized comparisons. Other measures should not be compared across areas.

The reader should be cautious, though, in drawing conclusions about differences or changes in the rates of drug misuse deaths or drug-related suicides. While a difference in the rates from one year to the next may signify a difference in drug-related mortality, other factors may confound such comparisons. For example, State laws differ in regard to which deaths are subject to ME/C review. There can be changes from year to year in toxicology testing protocols in a jurisdiction or in the number of cases still pending (i.e., not closed) at the end of the DAWN reporting year. All of these factors can affect the number of deaths determined to be DAWN cases or the number of deaths attributed to particular drugs. It is also important when interpreting change to consider that even small changes in the number of deaths can result in large changes in percentage terms.

UNDERSTANDING THE PROFILES

Mortality data for each participating metropolitan area and State are summarized in a two-page "profile" for that area. Shorter, one-page "spotlights" for individual jurisdictions or counties are also included. All profiles observe the following conventions:

- Drug-related deaths are summarized in two categories: drug misuse (including drug abuse) and drug-related suicide.
- The unit of measurement in all charts and tables is deaths or death rates per 1,000,000 population.
- Deaths by gender and age are presented in a common metric: deaths per 1,000,000 population.
- The most frequently involved drugs are reported by drug category (e.g., opiates/opioids, benzodiazepines).
- Data for both 2003 and 2004 are reported when the same jurisdictions participated in both years. Data from earlier years are not comparable.
- Small numbers (defined as 3 or fewer deaths) are not shown. We suppress these small numbers to protect individual identities.

Additional detail on the DAWN data collection methodology is provided in Appendix A. A glossary of terms used in this report appears in Appendix B.

Content of area profiles

Figure 1 shows the general layout of each two-page profile. Each profile has a map and seven components (tables and figures), labeled A through G.

Map

Each profile begins with a map displaying the boundaries of the metropolitan area or State and its component counties. Both participating and nonparticipating jurisdictions are shown. Jurisdictions that provided mortality data for 2004 are white. Jurisdictions in the area that did not provide data are lightly shaded. Areas outside of the metropolitan areas or States are darkly shaded.

A death investigation jurisdiction tends to be consistent with a county, whereas most metropolitan areas and all States comprise multiple counties and, therefore, multiple death investigation jurisdictions. In this publication, the terms "jurisdiction" and "county" are used synonymously to reflect the fact that data are aggregated at the county level, regardless of actual jurisdictional boundaries.[2]

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[2] These and other terms are defined in Appendix B.

Metropolitan-area definitions used in this publication are those established by the Office of Management and Budget (OMB), most recently based on the 2000 decennial Census.[3] These boundaries were updated in 2003.

Next to the map the following items appear:

- The number of drug-related deaths reported by participating jurisdictions that involved drug misuse and suicide;
- The total population of the area;
- The population covered by participating jurisdictions; and
- The percent of population residing in participating jurisdictions.[4]

Only metropolitan areas with more than 50% population coverage are given a full two-page profile. However, readers should always consider population coverage in interpreting these mortality data. For any area with population coverage less than 100%, one should not use the deaths in participating jurisdictions to generalize about deaths in nonparticipating jurisdictions.

Figure 1. Sample metropolitan-area profile layout
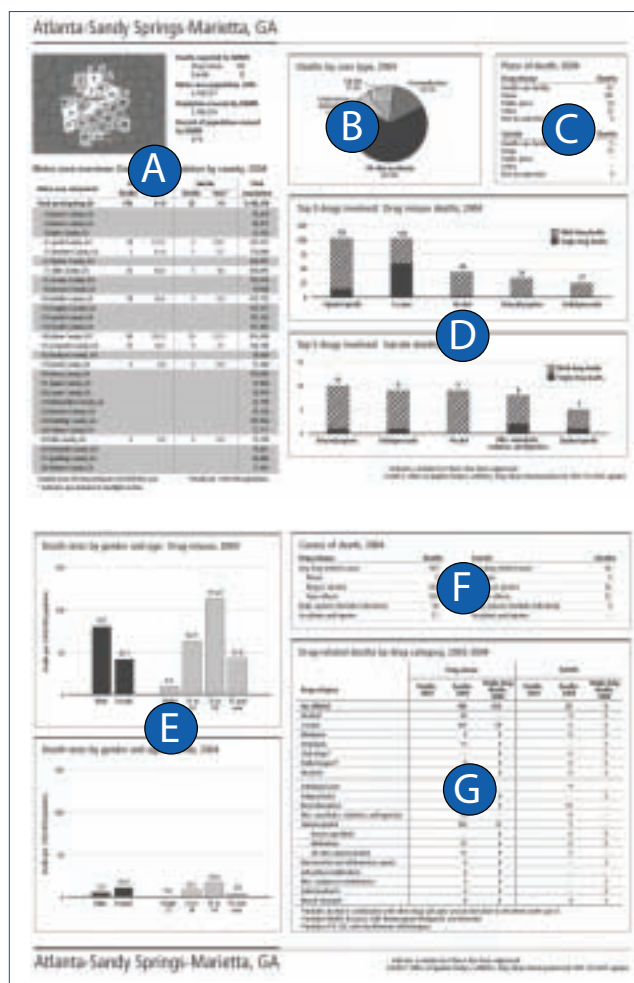
Table A: Metro-area overview: Deaths and population by county, 2004

Below the map, Table A lists each of the component jurisdictions for the area, which are numbered to correspond to their location on the area map. In metropolitan areas that cross State borders, jurisdictions are ordered first by State and then by county name. Rows for nonparticipating areas are shaded. Jurisdictions marked with an asterisk (*) are highlighted in separate Area Spotlights. In State profiles, jurisdictions marked with a dagger (†) are featured in metropolitan-area profiles.

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[3] Office of Management and Budget, Revised Definitions of Metropolitan Statistical Areas, New Definitions of Micropolitan Statistical Areas and Combined Statistical Areas, and Guidance on Uses of the Statistical Definitions of These Areas, Bulletin No. 03-04, June 6, 2003. Available from http://www.whitehouse.gov/omb/bulletins/b03-04.html.

[4] Population estimates for 2004 were obtained from the U.S. Census Bureau County Population at http://www.census.gov/popest/counties/CO-EST2004-01.html.

An overview of each jurisdiction's data is displayed in the remaining columns of Table A. For each participating jurisdiction, the table displays the number of drug misuse deaths and drug-related suicides, as well as the rate for each category (i.e., the number of deaths per 1,000,000 population). The rate, because it is population-adjusted, can be compared across jurisdictions and across metropolitan areas. This standardization does not take into account, however, the differences in State laws that specify which deaths are subject to ME/C review, nor does it take into account other factors, discussed previously, that may confound comparisons across years.

The final column shows the population for each participating and nonparticipating jurisdiction. This information makes clear for readers the extent of DAWN's coverage of the metropolitan area.

The top row of the table shows totals for the area, a count of participating jurisdictions (in parentheses), and the number of deaths and death rates for all the participating jurisdictions combined.

All subsequent tables and figures (B through G) are based on data aggregated across the participating jurisdictions in each metropolitan area or State.

Figure B: Deaths by case type, 2004

Figure B is a pie chart that shows the relative mix of case types for drug misuse and drug-related suicide deaths.[5] Solid slices are reserved for drug misuse cases; the patterned slice shows the suicide deaths. Reading clockwise, the drug misuse cases include:

- Overmedication cases, in the medium blue slice to the right of the suicide deaths;
- Homicide cases, in white;
- All other accidental deaths, in the darkest blue; and
- Deaths for which manner of death could not be determined, in the light blue slice.

Table C: Place of death, 2004

Table C summarizes the place of death for drug misuse and drug-related suicide cases separately. Deaths in emergency departments and other health care facilities have been aggregated into the single category "health care facility."

Figure D: Top 5 drugs involved in drug misuse deaths and suicides, 2004

Separate bar charts show the 5 most common drugs reported to DAWN for drug misuse deaths and drug-related suicides. The number shown above each bar is the number of deaths reported for the drug type shown. The bars also display the relative mix of deaths involving a single drug, as opposed to the number involving multiple drugs. The solid bottom portion of the bar represents deaths involving multiple drugs; the top, striped portion of the bar represents deaths involving only a single drug type. When small numbers (fewer than 4 deaths) have been suppressed, fewer than five bars are shown.

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[5] "Case type" and other terms are defined in Appendix B.

The drugs for this figure have been categorized as in Table G (discussed below). Note that the number of deaths cannot be summed across the bars, since multiple types of drugs are frequently involved in drug-related deaths. That is, a death that involved cocaine and heroin would appear in the bar for cocaine and in the bar for opiates/opioids. However, a death that involved two drugs of the same type (e.g., multiple opiates/opioids, such as methadone and heroin) would be counted only once in the bar for opiates/opioids and would be considered a single-drug death.

Grouping drugs in this fashion effectively eliminates double counting of redundant drug reports (e.g., "cocaine" and its metabolite "benzoylecgonine" reported for the same case); of potentially redundant reports from nonspecific terms (e.g., "heroin" and "opiates" reported for the same case); and of drugs that may be indistinguishable (e.g., "heroin" and "morphine"), depending on the time after death or method of testing. Enhanced training and automated prompts for DAWN reporters minimize but cannot eliminate these issues.

It is important also to remember that not every reported substance is, by itself, necessarily a cause of the death or even a contributor to the death. While improved training can reduce incidental reporting (i.e., reporting of drugs unrelated to the death), some incidental reporting will occur as a result of ambiguities in the case records. In some instances, a definitive determination of which drug or drugs contributed to the death may not be possible.

Figure E: Death rates by gender and age, 2004

Figure E displays the demographic characteristics of decedents in drug misuse deaths and suicide deaths, in terms of deaths per 1,000,000 population. Only population in participating jurisdictions is considered in the calculation of these rates. Taking population size into account is especially important for valid comparisons to be made across age and gender subgroups.

Table F: Causes of death, 2004

Table F summarizes drug misuse deaths and drug-related suicides by selected causes of death:

- ■ **Any drug-related cause** – This means that a cause of death explicitly implicated a drug. Drug-related causes include:
    - — Abuse – A subset of drug-related causes explicitly indicating drug or substance "abuse."
    - — Drug or alcohol – A subset of drug-related causes explicitly implicating a drug or alcohol.
    - — Toxic effects – A subset of drug-related causes indicating adverse effects or combined effects of drugs and/or alcohol, an overdose or lethal or excess amount, poisoning, or toxicity.

- **Body systems (includes infection)** – A cause of death implicating a specific body system (respiratory, cardiovascular, gastrointestinal, musculoskeletal, etc.) or an infection specific to a body system.
- **Accidents or injuries** – A cause of death indicating involvement of an external event (such as drowning, electrocution, fall, fire, motor vehicle, gunshot wound, hanging, homicide, stabbing, suffocation, etc.).

Drug-related deaths often involve multiple causes, so deaths cannot be summed across the causes listed.

Causes of death are reported to DAWN as they appear in text on the death certificate.[6] After receipt, each cause of death is coded and classified into categories. The categories were determined empirically, based on frequency of content and relevance to DAWN's audience. A single cause may be classified into multiple categories. For example, a cause of death reported as "heroin overdose" would be classified in two categories: drug-involved (i.e., the drug was denoted in the cause of death) and overdose.

After all causes were coded and classified, the six categories listed above were selected for inclusion in Table F. As might be expected, a drug-related cause of death was present for nearly all DAWN cases.

Table G: Drug-related deaths by drug category, 2003-2004

Table G summarizes the total number of drug misuse deaths and drug-related suicides according to the drug, or drugs, involved for 2004 and, for comparison, 2003. A selection of drug categories including illicit drugs, alcohol, and pharmaceuticals is shown. Deaths for 2003 are not shown when the data did not exist (e.g., due to nonparticipation) or are not comparable to those shown for 2004 (e.g., in Chicago, Cook County is included in 2004 but was a nonparticipant in 2003). Numbers less than 4 are suppressed to protect confidentiality.

The unit of measurement in this table is deaths, not drugs. The typical drug-related death reported to DAWN involves multiple drugs, so deaths cannot be summed across categories without double counting. DAWN cases include both drug-induced and drug-related deaths. As a result, readers should not assume that any given substance was, by itself, the cause of death.

Single-drug deaths. For the current year, the number of single-drug deaths is also shown for each drug category. This is the number of deaths involving the listed drug (or drug type) and no others. In nearly all instances, the number of deaths involving a single drug will be lower than the total number of deaths for which that drug was reported. Even in single-drug deaths, readers should not assume that the drug was necessarily the direct and sole cause of death.

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[6] DAWN does not collect causes of death coded according to the *International Classification of Diseases, 10th Revision.*

Drug categories. The 17 drug categories shown in this table are unique to this publication but are derived from DAWN's standard drug classification scheme.[7]

The first row of Table G summarizes deaths and single-drug deaths across all drug categories, those shown and those not shown in the rows below.

The rows following the total summarize deaths for selected drugs (or drug categories). Low-frequency drugs have been aggregated into larger categories. These rows include:

- **Alcohol.** Alcohol is reportable to DAWN for all ages if at least one other reportable substance was also present. In decedents under age 21, alcohol may be reported alone. Therefore, any single-drug death for alcohol is for a decedent under age 21. Alcohol is not included among the illicit drugs, although it is an illegal drug for individuals under age 21.

The next six rows in Table G pertain to illicit drugs. Included are:

- **Cocaine,** which includes both crack and powder cocaine.
- **Marijuana,** which includes marijuana and hashish. Importantly, some jurisdictions do not conduct toxicology tests for the presence of marijuana and do not report marijuana to DAWN. The full extent of the underreporting of marijuana is unknown.
- **Stimulants,** which include amphetamines and methamphetamine. This category does not include other central nervous system stimulants, such as caffeine or methylphenidate.
- **Club drugs,** which include methylenedioxymethamphetamine (MDMA, or Ecstasy), gamma hydroxy butyrate (GHB) and its precursor gamma butyrolactone (GBL), flunitrazepam (Rohypnol), and ketamine. In other settings or studies, the drugs classified as "club drugs" may exclude some of these drugs or include others, such as LSD or methamphetamine. Therefore, one should be cautious when comparing findings from DAWN with findings from other sources.
- **Hallucinogens,** which include LSD, PCP, and miscellaneous hallucinogens, such as psilocybin.
- **Inhalants,** which include anesthetic gases and any psychoactive nonpharmaceutical substance for which the documented route of administration was inhalation.

The remaining rows in Table G are devoted to prescription and over-the-counter pharmaceuticals, as well as heroin, which is listed with the other opiates/opioids. The drug categories included in this section are:

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[7] The classification of drugs used by DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification has been modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix C and can be found on the Internet at http://www.multum.com/.

- **Antidepressants,** which include monoamine oxidase inhibitors (MAOIs), selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, and miscellaneous antidepressants such as bupropion and venlafaxine.
- **Antipsychotics,** which include phenothiazine antipsychotics, psychotherapeutic combinations, thioxanthenes, and miscellaneous antipsychotic agents such as lithium and quetiapine.
- **Benzodiazepines,** which include alprazolam, clonazepam, diazepam, and others, including those reported simply as "benzodiazepines." Flunitrazepam, which is classified as a club drug, is not included as a benzodiazepine.
- **Miscellaneous anxiolytics, sedatives, and hypnotics,** which include diphenhydramine and zolpidem.
- **Opiates/opioids,** which include all types of natural and synthetic opiates and opioid analgesics. This category is the only one that is subdivided. The subdivisions are:
    - **Heroin (specified),** which includes heroin reported by name or its specific metabolites;[8]
    - **Methadone;** and
    - **All other opiates/opioids,** which include natural and synthetic opiates and opioid analgesics such as codeine, hydrocodone, oxycodone, and morphine, as well as reports designated simply as "opiates."[9]
- **Nonsteroidal anti-inflammatory agents (NSAIDs),** which include ibuprofen and naproxen. Cox-2 inhibitors are not classified as NSAIDs in the taxonomy used by DAWN.
- **Salicylates/combinations,** which include aspirin alone and in combination with other ingredients.
- **Miscellaneous analgesics/combinations,** which are primarily acetaminophen alone or in combination with other ingredients.
- **Anticonvulsants,** which include carbamazepine and gabapentin.
- **Muscle relaxants,** which include carisoprodol and cyclobenzaprine.

Readers should note that the total number of deaths in any given drug category (with the possible exception of alcohol, cocaine, and opiates/opioids) is often quite small, even in metropolitan areas with a relatively large number of drug misuse deaths. The presentation of these data, despite their low frequency, represents a deliberate effort to provide useful information about the relative occurrence of deaths related to different types of substances. However, numbers less than 4 have been suppressed to protect decedents' identities.

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[8] Overall, 95% of drugs in the category "heroin (specified)" were reported to DAWN as "heroin" or its metabolite "monoacetylmorphine." The remaining 5% were reported as acetylmorphine, diacetylmorphine, acetylcodeine, monoacetylcodeine, or heroin dope. Morphine and unspecified opiates are *not* included in this "heroin (specified)" category. Morphine is not classified as heroin because it is not possible to differentiate morphine, the metabolite of heroin, from morphine itself. Overall, the term "morphine" or "free morphine" accounted for 98% of reports classified as "morphine," and the term "opiates" accounted for 95% of the unspecified opiates.

[9] Some examples may assist readers in interpreting this classification. A death that involved heroin and methadone would be counted once in the "opiates/opioids" category, once in the "heroin (specified)" row, and once in the "methadone" row. A death that involved morphine (prescription morphine or the metabolite for heroin) would be counted in the "opiates/opioids" category and in the row for "all other opiates/opioids." A death that involved both morphine and codeine (a possible indicator for heroin) would be counted once in the "opiates/opioids" category and once in the row for "all other opiates/opioids."

State profiles

Six statewide ME/C systems participated in DAWN in 2004. A full two-page profile is provided for each of the following States:

- Maine,
- Maryland,
- New Hampshire,
- New Mexico,
- Utah, and
- Vermont.

Metropolitan areas in these States can be found in the metropolitan-area profiles in this publication. Only metropolitan areas that fell wholly within the State and reported more than 30 drug misuse or drug-related suicide deaths to DAWN in 2004 receive full two-page profiles. In 2004, these were:

- Albuquerque, NM;
- Baltimore-Towson, MD;
- Ogden-Clearfield, Provo-Orem, and Salt Lake City, UT; and
- Portland-South Portland, ME.

Abbreviated profiles for selected metropolitan areas

To warrant a full two-page profile, the participating jurisdictions of a metropolitan area (combined) must have reported more than 30 drug misuse or suicide deaths, and the area's population coverage must have exceeded 50%. If either of these two conditions was not met, an abbreviated profile is provided for the area.

In 2004, the following areas warranted abbreviated profiles due to low numbers of reported deaths:

- Bangor, ME;
- Burlington-South Burlington, VT;
- Fargo, ND-MN;
- Farmington, NM;
- Las Cruces, NM;
- Lewiston-Auburn, ME;
- Manchester-Nashua, NH;
- Salisbury, MD;
- Santa Fe, NM;
- Sioux Falls, SD; and
- St. George, UT.

In 2004, the following areas warranted abbreviated profiles because of low population coverage:

- Dallas-Fort Worth-Arlington, TX;
- Kansas City, MO-KS;
- Philadelphia-Camden-Wilmington, PA-NJ-DE-MD; and
- San Francisco-Oakland-Fremont, CA.

Abbreviated profiles include only a map and Table A. These show the specific counties included in the metropolitan area, the population of each, the identities of the component jurisdictions that participated in DAWN in 2004, the number of deaths involving drug misuse or drug-related suicide that were reported by each participating jurisdiction, and the population coverage of the participants relative to the entire area. If the number of participating jurisdictions or the number of reported deaths increases in future years to exceed the established levels, then full two-page profiles will be published for these areas. Likewise, if any area drops below either of these established levels in future years, only a map and Table A will be published for that area.

Area spotlight profiles

Area spotlight profiles focus on drug misuse deaths in key counties and cities within the participating metropolitan areas. As a general rule, spotlight profiles are produced for jurisdictions in which 60 or more misuse deaths were reported. These jurisdictions usually correspond to population centers of a metropolitan area or county containing the city for which the metropolitan area is named. Spotlight profiles are not produced for population centers when fewer than 60 misuse deaths were reported. Drug-related suicide deaths are not covered in spotlight profiles because the numbers so rarely exceed the 60-death threshold.

Spotlight profiles are provided for 35 jurisdictions for 2004. The following examples and exceptions apply:

- Albuquerque, NM: A spotlight profile is provided for Bernalillo County in the Albuquerque metropolitan area because it is both the major population center and contains the city of Albuquerque. This is the pattern followed for most of the spotlight profiles.

In a few metropolitan areas, spotlight profiles are provided for multiple counties when their large populations and/or local interest warrants specific listings. These areas include the following:

- Baltimore City and Baltimore County in the Baltimore-Towson, MD, metropolitan area;
- Essex, Middlesex, and Suffolk Counties in Boston-Cambridge-Quincy, MA-NH;
- Macomb, Oakland, and Wayne Counties in Detroit-Warren-Livonia, MI;
- Miami-Dade and Palm Beach Counties in Miami-Fort Lauderdale-Miami Beach, FL;
- Jefferson and Orleans Parishes in New Orleans-Metairie-Kenner, LA;
- Bronx, Kings, New York, and Queens Counties for New York City, as well as Suffolk County for the New York-Newark-Edison, NY-NJ-PA, metropolitan area;

- Camden and Delaware Counties, NJ, and Montgomery County, PA, in Philadelphia-Camden-Wilmington, PA-NJ-DE-MD;
- King and Snohomish Counties in Seattle-Tacoma-Bellevue, WA; and
- St. Louis City and St. Louis County, in St. Louis, MO-IL.

For some metropolitan areas, no spotlight profiles are necessary because the metropolitan area contains only one county or had only one county participating in DAWN:

- The San Diego metropolitan area includes only one county, San Diego County.
- The following metropolitan areas each contain multiple counties, only one of which participated in DAWN in 2004: Birmingham-Hoover, AL; Cleveland-Elyria-Mentor, OH; Houston-Baytown-Sugar Land, TX; Los Angeles-Long Beach-Santa Ana, CA; Milwaukee-Waukesha-West Allis, WI; Oklahoma City, OK; Phoenix-Mesa-Scottsdale, AZ; and Pittsburgh, PA.

In a few metropolitan areas the jurisdictions representing the population centers did not participate in DAWN in 2004, so it was not possible to spotlight these jurisdictions. However, in 2 metropolitan areas with less than 50% population coverage, spotlight profiles were possible for:

- Camden County, NJ, and Delaware and Montgomery Counties, PA, in the Philadelphia-Camden-Wilmington, PA-NJ-DE-MD, area; and
- San Mateo County in San Francisco-Oakland-Fremont, CA.

All the spotlights profile individual jurisdictions in essentially the same format as the State or full metropolitan-area profiles. The map shows only the spotlighted area relative to the rest of the metropolitan area; summary counts of drug misuse deaths, drug-related suicide deaths, county population, and death rates pertain only to the spotlighted jurisdiction. These, of course, match the counts and rates shown in the full profiles for the relevant jurisdiction.

Spotlights also include Figure B, Table C, Figures D and E, and Tables F and G, as described above. Because of the small numbers, drug-related suicide deaths have been removed from all but the jurisdiction summary and Figure B.

DAWN PARTICIPATION IN 2004

DAWN relies on the voluntary cooperation of medical examiners and coroners (ME/Cs) in selected areas of the United States to provide standardized data on drug-related deaths. For 2004, 150 jurisdictions in 46 metropolitan areas and 126 jurisdictions in 6 States submitted mortality data to DAWN (Table 1).[10] All jurisdictions are included for the 6 States—Maine, Maryland, New Hampshire, New Mexico, Utah, and Vermont. The 6 States also contributed 46 of the metropolitan-area jurisdictions. Metropolitan-area definitions adopted by DAWN in 2003 are those established by the Office of Management and Budget (OMB), based on the 2000 decennial Census.[11]

Among the 46 metropolitan areas, 31 reported more than 30 deaths related to drug misuse, and 14 reported more than 30 drug-related suicide deaths. Full two-page profiles of drug misuse and drug-related suicide deaths are provided for each of the 31 metropolitan areas. Abbreviated profiles are provided for 11 metropolitan areas that submitted 30 or fewer drug misuse deaths and for 4 metropolitan areas with less than 50% population coverage. Cases pending (i.e., incomplete) at the end of the data collection period are excluded. This publication was prepared with data that were submitted by June 10, 2005, for deaths that occurred during 2004.

An awareness of the extent of DAWN's coverage within a given area is essential to an accurate interpretation of DAWN mortality data. The mortality component of DAWN is not national in scope, and since the ME/C participants in DAWN are not part of a scientific sample, it is not possible to extrapolate from participating jurisdictions to the Nation as a whole. Nor is it possible to extrapolate to an entire metropolitan area when some jurisdictions within the metropolitan area do not participate in DAWN. In this publication, participation status for each jurisdiction is a key component of each area's profile.[12]

Table 1 lists the metropolitan areas and States represented in DAWN for 2004, the total number of death investigation jurisdictions (counties) in each area, the number and percentage of eligible counties for which mortality data were reported to DAWN, and the proportion of the total area's population that is covered by DAWN-participating jurisdictions. Information on population coverage is important because it shows that, although jurisdiction coverage is incomplete in many areas, the most populous counties within a given Metropolitan Statistical Area (MSA) are often represented. For example, Table 1 shows that only 1 (10%) of the 10 counties in the Houston metropolitan area participated in DAWN in 2004, but that county is home to 70% of the area's total population.

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[10] In this publication, the terms "jurisdiction" and "county" are used synonymously because ME/Cs are typically organized by county. For comparability across metropolitan areas, the 4 districts that make up Niagara County, NY, are counted as a single jurisdiction.

[11] Office of Management and Budget, Revised Definitions of Metropolitan Statistical Areas, New Definitions of Micropolitan Statistical Areas And Combined Statistical Areas, and Guidance on Uses of the Statistical Definitions of These Areas, Bulletin No. 03-04, June 6, 2003. Available from http://www.whitehouse.gov/omb/bulletins/b03-04.html.

[12] Recruitment efforts to increase participation by ME/Cs are ongoing. However, there are no plans to make the mortality component of DAWN national in scope.

Table 1

Participation of medical examiner/coroner jurisdictions in DAWN, 2004

Area	Total jurisdictions (counties)	Participating jurisdictions (counties)		Percent of population in participating jurisdictions
		Number	Percent of total	
Six states	126	126	100%	100%
Forty-six metropolitan areas	311	150	48%	79%
Metropolitan areas				
Albuquerque, NM	4	4	100%	100%
Atlanta-Sandy Springs-Marietta, GA	28	8	29%	67%
Baltimore-Towson, MD	7	7	100%	100%
Bangor, ME	1	1	100%	100%
Birmingham-Hoover, AL	7	1	14%	61%
Boston-Cambridge-Quincy, MA-NH	7	7	100%	100%
Buffalo-Cheektowaga-Tonawanda, NY	2	2	100%	100%
Burlington-South Burlington, VT	3	3	100%	100%
Chicago-Naperville-Joliet, IL-IN-WI	14	7	50%	75%
Cleveland-Elyria-Mentor, OH	5	1	20%	63%
Dallas-Fort Worth-Arlington, TX	12	2	17%	20%
Denver-Aurora, CO	10	5	50%	80%
Detroit-Warren-Livonia, MI	6	4	67%	94%
Fargo, ND-MN	2	1	50%	71%
Farmington, NM	1	1	100%	100%
Houston-Baytown-Sugar Land, TX	10	1	10%	70%
Indianapolis, IN	10	2	20%	61%
Kansas City, MO-KS	15	2	13%	14%
Las Cruces, NM	1	1	100%	100%
Lewiston-Auburn, ME	1	1	100%	100%
Los Angeles-Long Beach-Santa Ana, CA	2	1	50%	77%
Louisville, KY-IN	13	1	8%	58%
Manchester-Nashua, NH	1	1	100%	100%
Miami-Fort Lauderdale-Miami Beach, FL	3	2	67%	67%
Milwaukee-Waukesha-West Allis, WI	4	1	25%	61%
Minneapolis-St. Paul-Bloomington, MN-WI	13	7	54%	58%
New Orleans-Metairie-Kenner, LA	7	5	71%	79%
New York-Newark-Edison, NY-NJ-PA	23	10	43%	59%
Ogden-Clearfield, UT	3	3	100%	100%
Oklahoma City, OK	7	1	14%	59%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	11	6	55%	49%
Phoenix-Mesa-Scottsdale, AZ	2	1	50%	94%

Table 1 (continued)

Participation of medical examiner/coroner jurisdictions in DAWN, 2004

Area	Total jurisdictions (counties)	Participating jurisdictions (counties)		Percent of population in participating jurisdictions
		Number	Percent of total	
Pittsburgh, PA	7	1	14%	52%
Portland-South Portland, ME	3	3	100%	100%
Portland-Vancouver-Beaverton, OR-WA	7	3	43%	74%
Provo-Orem, UT	2	2	100%	100%
Salisbury, MD	2	2	100%	100%
Salt Lake City, UT	3	3	100%	100%
San Diego-Carlsbad-San Marcos, CA	1	1	100%	100%
San Francisco-Oakland-Fremont, CA	5	2	40%	23%
Santa Fe, NM	1	1	100%	100%
Seattle-Tacoma-Bellevue, WA	3	2	67%	76%
Sioux Falls, SD	4	1	25%	77%
St. George, UT	1	1	100%	100%
St. Louis, MO-IL	17	9	53%	84%
Washington-Arlington-Alexandria, DC-VA-MD-WV	20	19	95%	99%
States				
Maine	16	16	100%	100%
Maryland	24	24	100%	100%
New Hampshire	10	10	100%	100%
New Mexico	33	33	100%	100%
Utah	29	29	100%	100%
Vermont	14	14	100%	100%

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004 (11/2005 update).

Among the metropolitan areas, population coverage exceeded 90% in 21 metropolitan areas, with 100% coverage in 18 of those areas. The remaining metropolitan areas had response rates that range from a low of 14% in Kansas City to 84% in St. Louis. Population coverage below 50% usually equates to the absence of large jurisdictions, such as:

- Jackson County, MO, and Johnson County, KS, in Kansas City;
- Dallas and Tarrant Counties in Dallas-Fort Worth-Arlington;
- Philadelphia County in Philadelphia-Camden-Wilmington; and
- San Francisco, Alameda, and Contra Costa Counties in San Francisco-Oakland-Fremont.

Also notably absent from the 2004 mortality data are:

- Broward County in Miami-Fort Lauderdale-Miami Beach;
- Ramsey County in Minneapolis-St. Paul-Bloomington;
- Nassau and Westchester Counties, two of the largest of suburban counties in metropolitan New York; and
- Most of the New Jersey counties now included in the New York-Newark-Edison metropolitan area, the most populous of these being Bergen, Essex, and Middlesex.

Los Angeles County and Cook County in Chicago, both absent from DAWN in 2003, submitted mortality data in 2004.

Summary of findings

Table 2 provides a summary of the rates of drug misuse deaths and drug-related suicides per 1,000,000 population for metropolitan areas and States, along with their population and population coverage in DAWN for 2004.

Table 3 provides a summary of drug misuse deaths in 2003 and 2004 for metropolitan areas and States with consistent participation in both years.

Table 2
Rates of drug misuse deaths and drug-related suicides per 1,000,000 population, 2004

Metropolitan area or State	Drug misuse deaths per 1,000,000 population	Drug-related suicides per 1,000,000 population	Population covered by DAWN	Total area population, 2004	Percent of population covered by DAWN
Metropolitan areas					
Albuquerque, NM	188.1	21.8	781,447	781,447	100%
Atlanta-Sandy Springs-Marietta, GA	61.9	7.9	3,148,259	4,708,297	67%
Baltimore-Towson, MD	177.3	8.7	2,639,213	2,639,213	100%
Bangor, ME	87.7	13.5	148,196	148,196	100%
Birmingham-Hoover, AL	144.3	18.2	658,495	1,082,193	61%
Boston-Cambridge-Quincy, MA-NH	100.6	11.3	4,424,649	4,424,649	100%
Buffalo-Cheektowaga-Tonawanda, NY	86.6	8.7	1,154,378	1,154,378	100%
Burlington-South Burlington, VT	112.5	14.7	204,485	204,485	100%
Chicago-Naperville-Joliet, IL-IN-WI	99.0	7.2	7,058,121	9,391,515	75%
Cleveland-Elyria-Mentor, OH	136.2	18.5	1,351,009	2,137,073	63%
Dallas-Fort Worth-Arlington, TX	44.9	19.0	1,158,535	5,700,256	20%
Denver-Aurora, CO	115.2	28.4	1,866,449	2,330,146	80%
Detroit-Warren-Livonia, MI	152.5	12.1	4,223,117	4,493,165	94%
Fargo, ND-MN	31.1	7.8	128,615	181,520	71%
Farmington, NM	56.4	16.1	124,166	124,166	100%
Houston-Baytown-Sugar Land, TX	94.4	18.4	3,644,285	5,180,443	70%
Indianapolis, IN	109.2	19.2	989,460	1,621,613	61%
Kansas City, MO-KS	57.4	17.9	278,555	1,925,319	14%

Table 2 (continued)

Rates of drug misuse deaths and drug-related suicides per 1,000,000 population, 2004

Metropolitan area or State	Drug misuse deaths per 1,000,000 population	Drug-related suicides per 1,000,000 population	Population covered by DAWN	Total area population, 2004	Percent of population covered by DAWN
Las Cruces, NM	69.9	16.1	186,095	186,095	100%
Lewiston-Auburn, ME	74.8	9.3	107,022	107,022	100%
Los Angeles-Long Beach-Santa Ana, CA	104.5	16.8	9,937,739	12,925,330	77%
Louisville, KY-IN	81.4	12.9	700,030	1,200,847	58%
Manchester-Nashua, NH	75.3	12.5	398,574	398,574	100%
Miami-Fort Lauderdale-Miami Beach, FL	92.0	13.9	3,606,830	5,361,723	67%
Milwaukee-Waukesha-West Allis, WI	159.5	32.3	928,018	1,515,738	61%
Minneapolis-St. Paul-Bloomington, MN-WI	46.2	13.7	1,820,108	3,116,206	58%
New Orleans-Metairie-Kenner, LA	227.8	16.3	1,040,482	1,319,589	79%
New York-Newark-Edison, NY-NJ-PA	95.8	7.7	10,993,893	18,709,802	59%
Ogden-Clearfield, UT	119.4	27.2	477,455	477,455	100%
Oklahoma City, OK	196.8	44.1	680,815	1,144,327	59%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	108.8	21.9	2,830,241	5,800,614	49%
Phoenix-Mesa-Scottsdale, AZ	113.1	19.1	3,501,001	3,715,360	94%
Pittsburgh, PA	168.7	21.6	1,250,867	2,401,575	52%
Portland-South Portland, ME	97.9	13.7	510,791	510,791	100%
Portland-Vancouver-Beaverton, OR-WA	101.1	19.7	1,523,690	2,064,336	74%
Provo-Orem, UT	128.5	4.9	412,361	412,361	100%
Salisbury, MD	130.8	17.4	114,645	114,645	100%
Salt Lake City, UT	168.8	30.4	1,018,826	1,018,826	100%
San Diego-Carlsbad-San Marcos, CA	96.5	21.1	2,931,714	2,931,714	100%
San Francisco-Oakland-Fremont, CA	113.2	15.9	945,261	4,153,870	23%
Santa Fe, NM	144.2	14.4	138,705	138,705	100%
Seattle-Tacoma-Bellevue, WA	139.2	21.5	2,421,417	3,166,828	76%
Sioux Falls, SD	0.0	25.4	157,366	203,324	77%
St. George, UT	118.3	27.3	109,924	109,924	100%
St. Louis, MO-IL	89.1	20.0	2,345,212	2,787,701	84%
Washington-Arlington-Alexandria, DC-VA-MD-WV	52.0	7.9	5,091,886	5,139,549	99%
States					
Maine	97.9	20.5	1,317,253	1,317,253	100%
Maryland	117.8	7.2	5,558,058	5,558,058	100%
New Hampshire	75.4	10.8	1,299,500	1,299,500	100%
New Mexico	142.4	22.6	1,903,289	1,903,289	100%
Utah	143.6	22.6	2,389,039	2,389,039	100%
Vermont	99.8	14.5	621,394	621,394	100%

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004 (11/2005 update).

Table 3

Rates of drug misuse deaths and percentage of change, 2003 and 2004

Metropolitan area or State	Rate of drug misuse deaths per 1,000,000 population		Percentage change in rate, 2003 to 2004	Total area population, 2004
	2003	2004		
Metropolitan areas				
Albuquerque, NM	204.0	188.1	-7.8%	781,447
Baltimore-Towson, MD	205.6	177.3	-13.8%	2,639,213
Birmingham-Hoover, AL	135.2	144.3	6.7%	1,082,193
Boston-Cambridge-Quincy, MA-NH	109.5	100.6	-8.1%	4,424,649
Buffalo-Cheektowaga-Tonawanda, NY	56.1	86.6	54.4%	1,154,378
Detroit-Warren-Livonia, MI	129.4	152.5	17.9%	4,493,165
Houston-Baytown-Sugar Land, TX	65.3	94.4	44.6%	5,180,443
Indianapolis, IN	73.0	109.2	49.6%	1,621,613
Louisville, KY-IN	101.6	81.4	-19.9%	1,200,847
Milwaukee-Waukesha-West Allis, WI	143.6	159.5	11.1%	1,515,738
Ogden-Clearfield, UT	91.7	119.4	30.2%	477,455
Oklahoma City, OK	91.7	196.8	114.6%	1,144,327
Phoenix-Mesa-Scottsdale, AZ	114.8	113.1	-1.5%	3,715,360
Portland-South Portland, ME	97.0	97.9	0.9%	510,791
Portland-Vancouver-Beaverton, OR-WA	96.4	101.1	4.9%	2,064,336
Provo-Orem, UT	127.8	128.5	0.5%	412,361
Salt Lake City, UT	183.0	168.8	-7.8%	1,018,826
San Diego-Carlsbad-San Marcos, CA	120.1	96.5	-19.7%	2,931,714
Seattle-Tacoma-Bellevue, WA	91.2	139.2	52.6%	3,166,828
States				
Maine	88.1	97.9	11.1%	1,317,253
Maryland	126.5	117.8	-6.9%	5,558,058
New Hampshire	87.8	75.4	-14.1%	1,299,500
New Mexico	161.6	142.4	-11.9%	1,903,289
Utah	138.6	143.6	3.6%	2,389,039
Vermont	119.5	99.8	-16.5%	621,394

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2004 (11/2005 update).